NOTES ON THE CLASSIFICATION OF TORYMUS WITH THE BIOLOGY AND DESCRIPTION OF A NEW SPECIES

(Hymenoptera: Torymidae)

BY KENNETH R. HOBBS

Oregon State College, Corvallis[2]

Torymus festivus Hobbs, new species

Female: Length 2.5 mm.; ovipositor 2.2 mm. Body blue-green with purple reflections on propodeum and dorsal surface of abdomen. *Head* transverse, wider than thorax, slightly wider than long as viewed from the front; front green with lateral area beyond clypeal region blue with yellow reflections near eye margins; face below antennae with long, delicate hairs becoming short above; two fine carinae extending upward from margin of mouth curving slightly mesad and about as long as the basal distance between them; a prominent median carina; antennal depressions deep, bright shiny blue; scape somewhat compressed, not reaching median ocellus, yellow beneath and fuscous above, pedicel and ring segment infuscate; funicle and club brown with light brown longitudinal sense organs extending almost the entire length of each segment and beyond apical margin of each funicular segment; all segments of funicle sub-quadrate increasing in width toward the tip; ocelli brownish-red; eyes red.

Thoracic dorsum blue-green, minutely punctured, moderately clothed with short whitish hairs anteriorly to very long whitish hairs posteriorly on scutellum; parapsidal furrows distinct; scutellar crossfurrow absent; propodeum weakly reticulate, shining bluish-purple anteriorly to purple posteriorly, green laterally; fore coxa blue-green with apex yellow, middle and hind coxa green; basal and apical portions of femur and tibia honey yellow, median portion brown with metallic green reflections from hind femur; front tibial spur bifid as seen under high power; first three segments of tarsi approaching white, the last two dark brown; wings moderately ciliate; veins testaceous, a small crescent-shaped vein remnant one-fourth the distance from the base of wing in middle; stigmal vein petioled.

Abdomen longer than thorax; dorsal surfaces blue-green, finely reticulate, sparsely clothed with silky white hairs, fourth segment blue, moderately reticulate with long white hairs laterad; segments

[1]This publication is a portion of the thesis submitted in partial fulfillment of the requirements for the degree of Master of Arts from the graduate school of Oregon State College.

[2]Instructor, California State Polytechnic College, Voorhis Unit, San Dimas, California.

five and six bluish-green with yellow reflections, reticulations and hairs same as for segment four; the sterna infuscate; pygostyle with one heavy and three fine setae of approximately equal length.

Male: Length 1.95 mm. Scape short, light brown basally, the remainder being dark blue-green with purple reflections; abdomen dark brown with bluish reflections dorso-basally, the remainder, dorsally, yellow-green; in other respects the male is like the female.

Type locality: Campus of Oregon State College, CORVALLIS, OREGON. Host: *Dasyneura* sp. infesting seeds of *Thuja plicata* Don. and *Chamaecyparis lawsoniana* Parl.

Location of the Types: The female type, the male allotype, 50 female and 50 male paratypes are in the California Academy of Sciences. 12 female and 12 male paratypes have been deposited in each of the following institutions: U. S. National Museum; Southern California Academy of Sciences, Los Angeles; American Museum of Natural History, New York; Museum of Comparative Zoology, Cambridge, Mass.; State Natural History Survey Division, Urbana, Ill.; British Museum (Nat. Hist.), London; Cornell University; State College of Washington, and the Oregon State College collection. The following private persons have received 6 female and 6 male paratypes: Dr. Osmond P. Breland and Dr. W. W. Jones. 43 female and 7 male paratypes are in the author's collection. There is a total of 193 female and 158 male paratypes.

Described from 165 females and 136 males collected by sweeping *T. plicata* and *C. lawsoniana,* August 23 and 24 and September 27, 1947; 5 females and 10 males by sweeping, Corvallis, Oregon, June 2 and 11, 1948; 2 females and 4 males reared in laboratory during April, 1948, and emerged in laboratory May 7, 1948; 1 female from Estacada, Oregon, collected in cones March 26, 1948, and emerged in laboratory on May 11, 1948; 2 females and 1 male collected in cones at Port Orford, Oregon, on May 30, 1948, and emerged in laboratory on June 3, 1948; 19 females and 8 males collected in Ashland, Oregon, in cones on May 18, 1948, and emerged in laboratory from May 23 until June 15, 1948. Specimens not included in the type series were also found in cones from 10 miles west of Philomath, Oregon and 12 miles east of Cave Junction, Oregon. In the material inspected, specimens were not found in cones from the following localities: Campus of Chico State College, Chico, California; and Hillsboro, Oregon.

Variation—The general color of the male and especially the female varies from green with a few slight yellow reflections to rather dark purple. In one particular specimen, also included in the type series, the lateral and ventral body regions and coxa were a brilliant ruby red. In other respects, there can be no doubt that this specimen belongs to *T. festivus*. The femur and tibia of both sexes varied from honey yellow to brown to bright blue-green. In the female, the length of the body varies from 1.65 mm. to 2.90 mm. and the ovipositor from 1.40 mm. to 2.40 mm. In only one instance was the ovipositor found to be the same length as the body. The average body length is 2.14 mm.; the average ovipositor length, 1.85 mm. The body of the male varies in length from 1.30 mm. to 2.30 mm., the average being 1.90 mm.

Torymus festivus is most closely related to *Torymus coloradensis* Huber whose host is *Cecidomyia* species gall on *Artemisia*. *T. coloradensis* Huber, however, differs in the following respects: body generally green, all segments of the funicle longer than wide, mesepimeron very deeply incised, coppery, and wings strongly ciliated. It is interesting to note that the hosts of both parasites belong to the same family of Diptera.

BIOLOGY

While studying the development of the torymid life cycle, I had the unusual opportunity of watching the continuous change from the last larval instar to the pupal stage. Three days before pupation, the development of the hind intestine and anus is evidenced by the clearing of the ventriculus of all waste products. At first the body becomes slightly constricted marking off the thorax from the abdomen. Shortly the appendages begin to form ventrally and the abdomen lengthens. The legs appear first and are followed by the antennae and wings. By the time the wings and head take their shape, a large mass of tissue forms on the posterior end of the body, dorsally. The abdomen swells and by writing movements the skin is split over the head and worked off in about 10 minutes. From the mass of tissue just mentioned, the ovipositor commences to grow up over the abdomen to a position overlapping the scutellum. The growth of the ovipositor is assisted by great arching movements on the part of the body. The complete growth of this organ takes slightly more than 30 minutes. Complete pupation takes less than 18 hours under laboratory conditions.

Since neither description nor illustration of the egg or larva of this genus could be found in the literature, a description of the egg and last larval instar is included herein. Females of several species of *Torymus* were dissected and the eggs were found to be constant in general shape and in surface texture. The egg of *T. festivus* is 0.58 mm. in length and 0.17 mm. wide. It is largest toward the anterior end and tapers gradually to a point posteriorly. The anterior end becomes restricted rapidly and ends in a prominent projection. The surface is smooth, without evidence of minute nodules or projections as found on the eggs of many members of the same family.

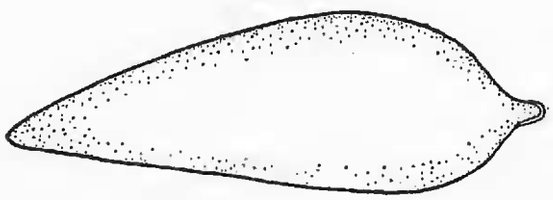

FIG. 1

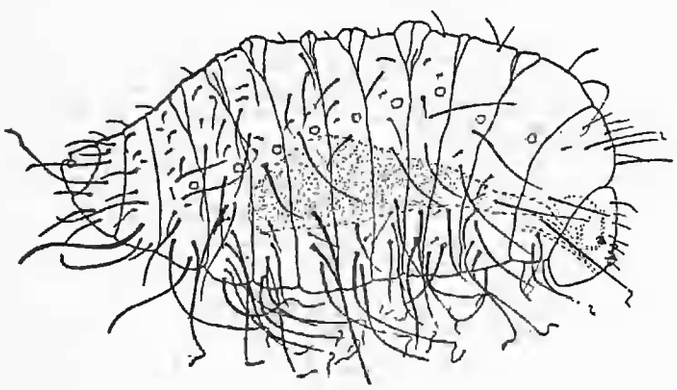

FIG. 2

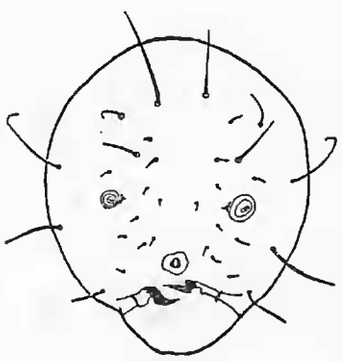

FIG. 3

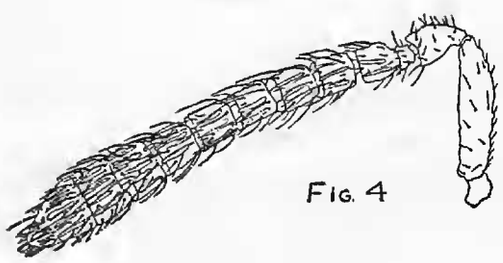

FIG. 4

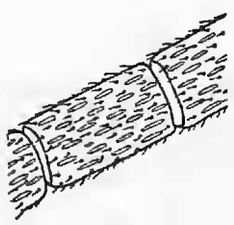

FIG. 5

EXPLANATION OF FIGURES

Fig. 1, lateral view of egg of *Torymus festivus;* Fig. 2, lateral view of mature larva of *T. festivus;* Fig. 3, front view of head of larva showing setal patterns; Fig. 4, antenna of female; Fig. 5, semidiagramatic drawing of portion of antenna of *T. gigantum* to show contrast with Fig. 4; Fig. 6, lateral view of thorax of adult female; Fig. 7, lateral view of abdomen of adult female; Fig. 8, front view of the head of adult female; Figs. 9, 10, 11 are photomicrographs of ovipositor saw, antenna and wing of *T. festivus female.*

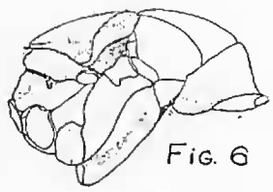

Fig. 6

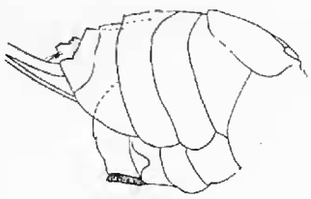

Fig. 7

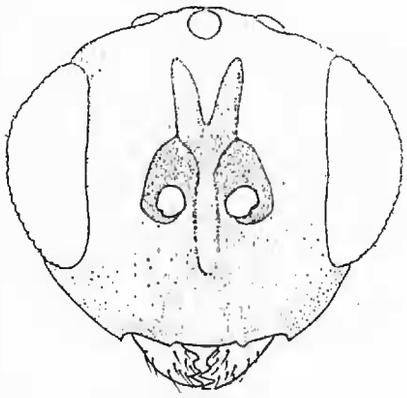

Fig 8

Fig. 9. Ovipositor saw

Fig. 10. Antenna

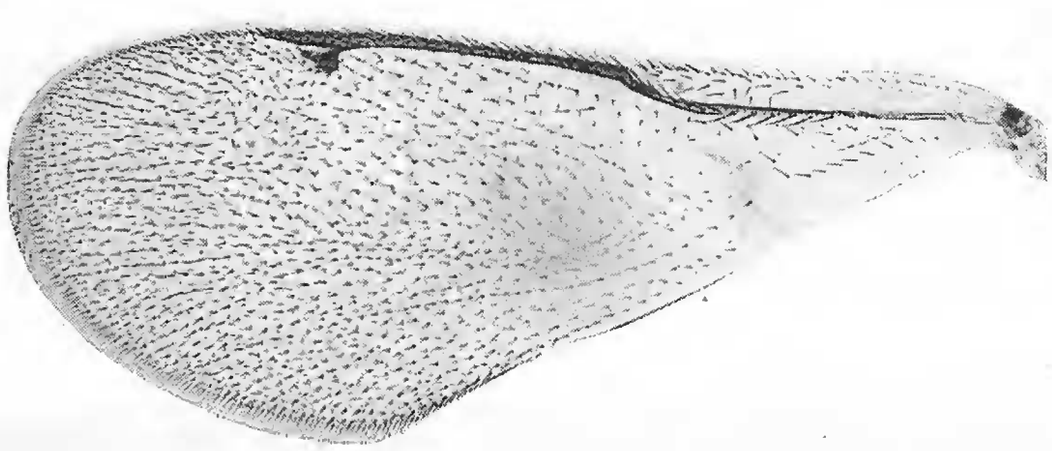

Fig. 11. Wing.